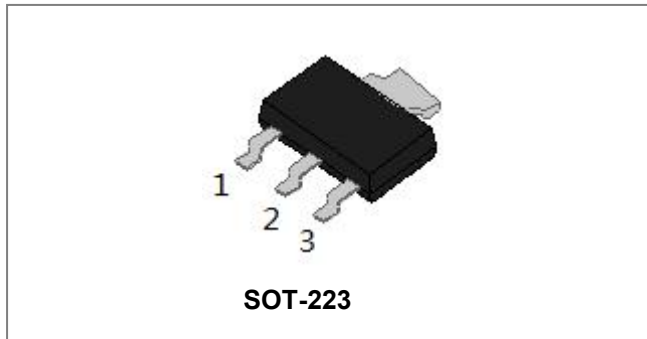
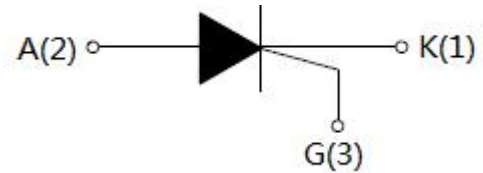


## SX020V Sensitive gate SCRs



### Circuit Diagram



### Description

The SX020V provide high dv/dt rate with strong resistance to electromagnetic interface. They are especially recommended for use on residual current circuit breaker, straight hair, igniter etc.

### Maximum Ratings:

Characteristics	Symbol	Condition	Max.	Units
Storage junction temperature range	$T_J$	-	-40 to +110	°C
Operating junction temperature range	$T_{stg}$	-	-40 to +150	°C
Repetitive peak off-state voltage	$V_{DRM}$	-	600	V
Repetitive peak reverse voltage	$V_{RRM}$	-	600	V
RMS on-state current	$I_{(TRMS)}$	SOT-223(TC=80°C)	2	A
Non repetitive surge peak on-state current(tp=10ms)	$I_{TSM}$	-	20	A
I <sup>2</sup> t value for fusing (tp=10ms)	$I^2t$	-	2	A <sup>2</sup> s
Critical rate of rise of on-state current	dI/dt	-	50	A/μs
Peak gate current (tp=20 μs, Tj=110°C)	$I_{GM}$	-	0.2	A
Peak gate power (tp=20 μs, Tj=110°C)	$P_{GM}$	-	0.5	W
Average gate power dissipation(Tj=110°C)	$P_{G(AV)}$	-	0.1	W

**Electrical Characteristics**( $T_j=25^{\circ}\text{C}$  unless otherwise specified)

Symbol	Condition	Min.	Typ.	Max.	Units
$I_{GT}$	$V_D=12\text{V } R_L=33\Omega$	-	50	200	$\mu\text{A}$
$V_{GT}$		-	0.6	0.8	V
$V_{GD}$	$V_D=V_{DRM} T_j=110^{\circ}\text{C}$	0.2	-	-	V
$I_L$	$I_G=1.2 I_{GT}$	-	-	6	mA
$I_H$	$I_T=0.05\text{A}$	-	-	5	mA
dV/dt	$V_D=2/3V_{DRM} T_j=110^{\circ}\text{C} R_{GK}=1\text{K}\Omega$	20	-	-	V/ $\mu\text{s}$

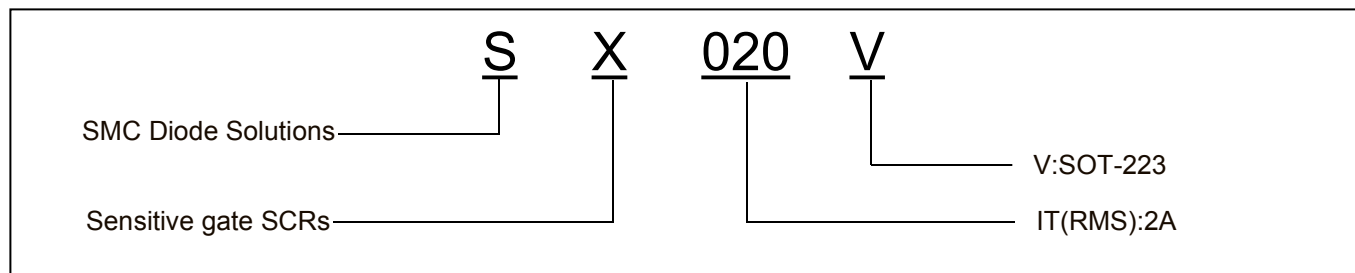
**Static Characteristics**

Symbol	Condition	Max.	Units
$V_{TM}$	$I_{TM}=4\text{A } t_p=380\mu\text{s}, T_j=25^{\circ}\text{C}$	1.5	V
$I_{DRM}$	$V_D=V_{DRM} V_R=V_{RRM}, T_j=25^{\circ}\text{C}$	5	$\mu\text{A}$
$I_{RRM}$	$V_D=V_{DRM} V_R=V_{RRM}, T_j=110^{\circ}\text{C}$	100	$\mu\text{A}$

**Thermal Resistances**

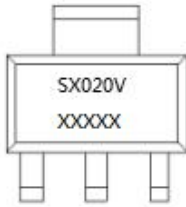
Symbol	Condition	Value	Units
$R_{th(j-c)}$	Junction to case    SOT-233	7.3	$^{\circ}\text{C/W}$

**Ordering Information**



Device	Package	Shipping
SX020V	SOT-223	8000pcs/ reel
SX020VTR	SOT-223	8000pcs/ reel

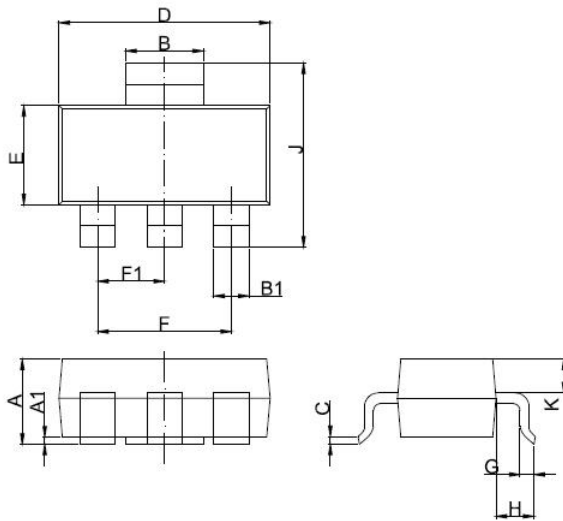
## Marking Diagram



Where XXXXX is YYWWL

S = SMC  
X = Sensitive gate SCRs  
020 = Forward Current (2A)  
V = Package type  
YY = Year  
WW = Week  
L = Lot Number

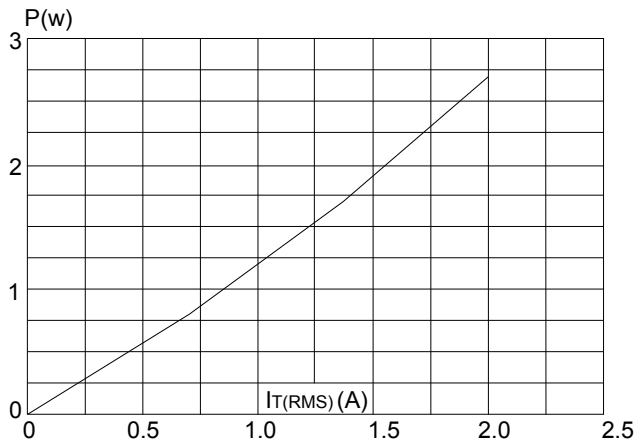
## Mechanical Dimensions SOT-223



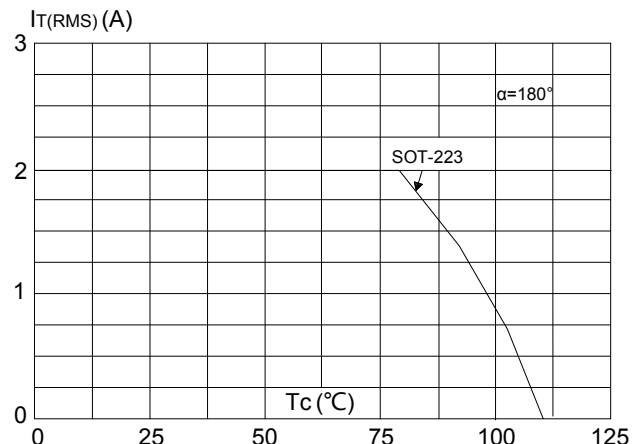
SYMBOL	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.5	1.6	1.8	0.059	0.063	0.071
A1	0.01	0.06	0.10	0.001	0.002	0.004
B	2.9	3.0	3.1	0.114	0.118	0.122
B1	0.6	0.7	0.8	0.024	0.028	0.031
C	0.22	0.26	0.32	0.009	0.010	0.013
D	6.3	6.5	6.7	0.248	0.256	0.264
E	3.3	3.5	3.7	0.130	0.138	0.146
F		4.6			0.181	
F1		2.3			0.091	
G	0.7	0.9	1.1	0.028	0.035	0.043
H	1.50	1.5	2.0	0.059	0.069	0.079
J	6.7	7.0	7.3	0.264	0.276	0.287
K	0.8	0.9	1.0	0.031	0.035	0.039

## Ratings and Characteristics Curves

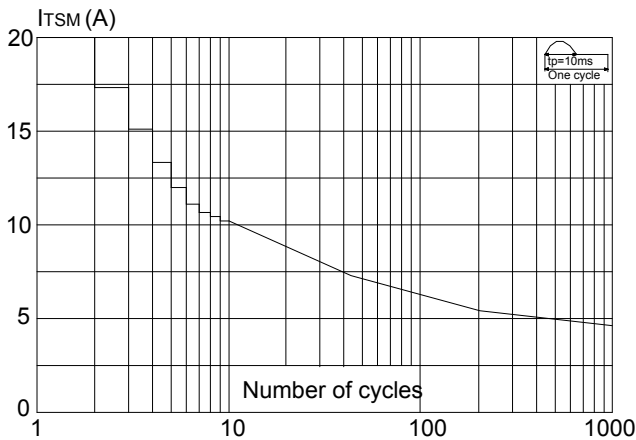
**FIG.1:** Maximum power dissipation versus RMS on-state current



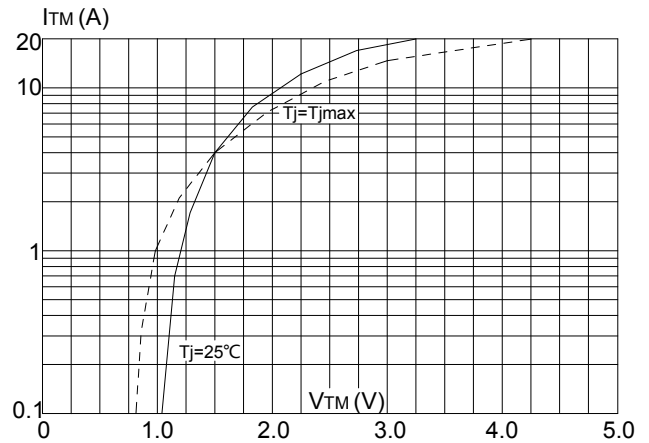
**FIG.2:** RMS on-state current versus case temperature



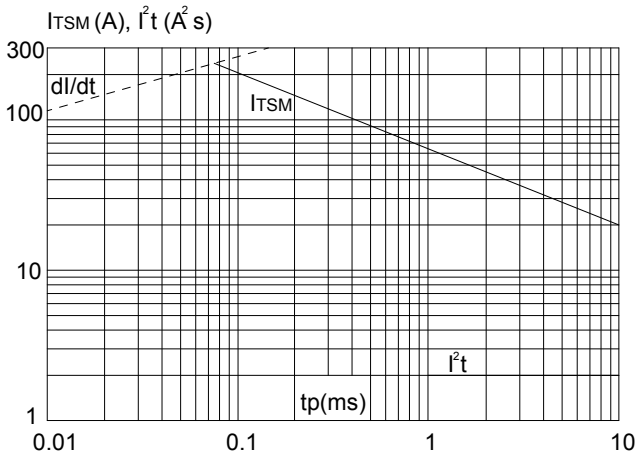
**FIG.3:** Surge peak on-state current versus number of cycles



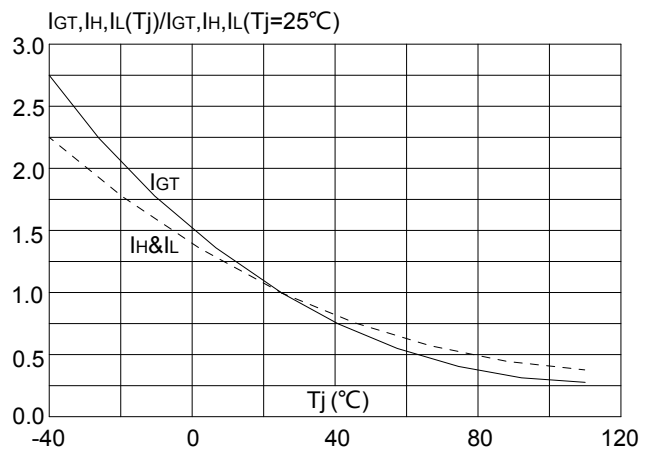
**FIG.4:** On-state characteristics (maximum values)



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ , and corresponding value of  $\int I^2 t$  ( $di/dt < 50A/\mu s$ )



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature





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